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ABSTRACT

The magnitude, diversity, and impact of distance education are discussed in this international review of its implementation in economically diverse countries. Uses of the following media are described: (1) print--correspondence study, programmed instruction, modularized instruction, newspaper; (2) audio media--telephone, radio, subsidiary communications authority; (3) video media--broadcast and cable television, instructional television fixed service, videocassettes and videodiscs, satellites; and (4) computers, especially computer assisted instruction and computer managed instruction. Discussion of organization and administration focus on organizational structure, cooperation with other institutions, finances, course development costs, student services, telephone and computer-assisted counseling, and registration. Faculty and student issues discussed include faculty rewards, delivery faculty roles, development faculty roles, and student characteristics and attrition. Research and evaluation are briefly reviewed in terms of determining learner needs, evaluation criteria, and comparisons with campus institutions. A summary, conclusions, and a 7-page reference list are included. (LMM)

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Distance Education

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DISTANCE EDUCATION

Electronics technology is believed to offer the greatest instructional revolution in education in five centuries (Carnegie Commission, 1972, p. 1). With the shortage of faculty members in the 1960's, technology offered to make learning more independent of instructors. Although that independent learning did not save time or money in all cases, it proved advantageous for other reasons: allowing students a more active role in learning, providing alternative modes of instruction for students who did not learn well in conventional classes, and allowing students greater flexibility in scheduling and locations of classes (p. 10).

Commitments were made in the past 15 years to humanize education by increasing access for all kinds of citizens and making instruction more responsive to individual needs. As Cross observes, the commitment went from education for all to education for each (1976, p. 49). Distance education programs have emerged throughout the world to serve new students in ways that are important to them.

Distance education will be used interchangeably with the terms open learning or extended degree program because these terms all represent greater opportunities for learning through flexible adjustments in the time schedule and physical location of classes.

Methods of Delivery

In these times of increasing concern about providing the most cost-effective educational program, high priorities within the media selection process must be given to what costs least, is least complicated, most accessible, and still produces the desired results. To understand this process, various methods of delivering instructional materials are now examined.

Print

In many instances the best medium may be the printed word. In addition to being very familiar to almost all learners, it is inexpensive and portable. Since it offers a fixed presentation format, students can look at any part of its message in any order for any length of time. Furthermore, print materials are easily distributed to learners using existing mail and package delivery systems.

Correspondence Study. Distant learners are provided with a set of sequential instructional and testing print materials for each course in which the student is enrolled. Correspondence study was first employed in the United States by the University of Chicago under the leadership of William Rainey Harper and the University of Wisconsin's Extension Division under William H. Lighty at the turn of the twentieth century. An excellent guide to primary sources on the historical and organizational development of correspondence schools (public, private, and military) can be found in Mathieson (1971). A comprehensive international overview of correspondence instruction is also available in MacKenzie and Christensen (1971).

Programmed Instruction. The most sophisticated instructional design for print materials is programmed instruction (PI) which presents material in a definite sequence of steps which leads the student to a specified educational objective. The student works at his own pace by actively writing or selecting answers to questions. The student receives immediate feedback about the correctness of his responses. Several variations of programmed instruction exist. In a linear program, the sequence of steps is identical for all students. A branching program offers instruction for any of the several responses (correct and incorrect) that a student may select. Combination

programs employ both linear and branching formats. Another type, a mathematics program, employs branching as well as task simulations (Ohio State University, 1977).

Research studies show that there are no overall significant differences in achievement between programmed and traditional instruction (Jamison, Suppes and Wells, 1974; Nash, et al, 1971). This equal effectiveness was found true for intellectual skills, information, attitudes, and motor skills. Yet, low- and high-ability students were observed to benefit more by PI than average students. A major difference observed is in the substantially diminished student learning time needed (Nash, et al, 1971). The chief policy question, then, is whether the saving of time is worth the additional cost and faculty time.

Modularized Instruction. The use of instructional modules permits students to work at differing rates by employing single-concept units of study to construct learning experiences of any needed magnitude and content coverage. Modules provide students with immediate feedback so that they can determine if mastery is achieved. Modules can employ different media to heighten the chances that a student will master a particular concept. Cross found that about three-quarters of all community colleges are using such modules (1976, p. 75).

Emphasis upon the written word, self-pacing, and unit mastery are key features of the general instructional approach known as the personalized system of instruction (PSI), or Keller Plan (Robin, 1975). The other two key features of PSI, meeting with proctors for periodic testing and feedback, as well as attending periodic lectures for motivation, pose more difficulty for the distant learner unless they are near a study center offering such activities.

While PSI is thought to have a strong enough emphasis on written materials to pose potential problems for poor readers, the audio-tutorial

approach schedules students into study carrels with a tape recorder, film and/or slide projector, and physical models in addition to written modules. Taped instructions guide students through each unit. Informal small and large group meetings are also held once a week.

While research evidence shows a small significant increase in the achievement of audio-tutorial students when compared with those in classroom-only courses, with little negative effect on attrition and no diminishing of student attitudes toward learning, PSI has demonstrated more impressive results. When compared to lecture classes, end-of-course achievement of PSI students was 10% higher, long-term retention after several months was 13% higher, and attitudes toward learning were more positive. A four percent higher drop-out rate was also noted (Robin, 1976). Another disadvantage that must be taken into account is that it takes a faculty member about one-and-one-half times as much effort to prepare a PSI course rather than conventional instruction (Johnston, 1975, p. 87).

Newspaper. The use of newspapers to present college-level course materials was begun in the United States in 1973 by the University Extension of the University of California at San Diego. Since that time, more than 700 colleges and universities and almost 1200 newspapers have participated. More than 40,000 students have earned credit in the first ten courses offered (Colburn, 1978).

The U. S. National Endowment for the Humanities has given sustained financial support for the development of these newspaper courses as well as special financing of community forums on course topics in conjunction with the American Association of Community and Junior Colleges (AACJC). A staff of eight people is responsible for overall development and production.

The annual budget is about $600,000. The national office receives $6 per enrollee from schools with enrollments of 10 or more students, plus royalties from book sales. The newspaper articles and illustrations are distributed for free by United Press International.

Participating colleges are required to hold at least two contact sessions per course. A book of background readings and a study guide for review are available from publishers for each course. In the fall of 1980 a television series produced by BBC and Time-Life Films was joined with a national newspaper course, Connections: Technology and Change, the first such merger on a national scale (Gross, 1979).

The Department of Extra-Mural Studies of Makerere University College uses Uganda's weekly newspaper as a medium of distribution. It has the same faculty and staff as the campus. Its courses cover the same content (Erdos, 1970).

Kelly and Anandam (1979) observe two basic truths about distant learners: (1) some must learn at a distance or not at all; and (2) most succeed with the assistance of external motivators or not at all (p. 78). The use of media in addition to print-based correspondence units is done partially for that reason. A weekly broadcast of radio or television lessons serves to pace students through the course material. Correspondence courses have had dramatic improvement in completion rates with the addition of regular television broadcasts (Lipson, 1977).

Audio Media

The Telephone. Stemming from a long-term commitment to statewide outreach programs, the Univeristy of Wisconsin in the U.S. has employed the telephone for instruction on a wide scale. The chief advantages of the telephone are low cost, interactive communication, and flexibility. It can handle telewriters, graphic input devices (electronic blackboards) and slow-scan televideo systems. The major organizational mechanisms have been the Educational Telephone Net-Work (ETN) and the Statewide Extension Education Network(SEEN). Together these networks serve over 30,000 engineers, teachers, physicians, nurses, librarians, lawyers, business people and others (Parker, 1976).

The Educational Telephone Network has tied together 210 meeting places in 100 cities and towns. Each location has a loudspeaker and four microphones to permit group interaction. Instruction has been offered for 55 hours each week in 34 courses involving 50 faculty and 600 students. Most classes lasted 90 minutes and involved 100 students at a time. The cost was 14¢ per student for production and operation. Two important conditions of operation were dedicated telephone trunk lines and the use of good written materials.

Evaluation of the network courses have been quite positive, with 88 percent of the students saying they would take another course taught that way. University costs were much below those of other shorter length courses or workshops.

One of the few case studies of the use of the telephone in Europe, at the University of Lund in Sweden, was provided by Flinck (1975), who describes the telephone as a motivational feeback device in an educational psychology course. Of particular interest was the discovery that in ten percent of the phone calls over half the content was personal counseling. In the U.S. Anandam and Fleckman (1978) also descibe the telephone as a successful motivator of students.

Radio. The Open University in England has drawn some conclusions about the pedagogical value of radio. It can pace students through the instructional material of a course. In addition, it can provide feedback to students so that they have a sense of belonging. At the same time corrections can be made to existing materials. Primary resource materials such as performances, speeches, and discussions can be brought directly to students. It can influence the public at large as well as students. Finally, radio can modify student attitudes by presenting material in a novel or dramatic way or from an unfamiliar viewpoint (MacKenzie, Postgate & Scupham, 1975, p. 60). A more recent trend in the provision of audio materials is to send cassettes until the student enrollment reaches over 500, at which time it becomes cost effective to use broadcast radio.

Radio Sweden broadcasts more than 166 hours of instruction a year to over 12,000 participating schools. In

Columbia the success of Acción cultural popular (Action for Popular Culture), an effort of the Catholic Church with some government help, has stimulated the continuing development of rural radio for education throughout Latin America.

Subsidiary Communications Authority. In addition to FM radio providing a high quality, static-free signal, with the permission of the Federal Communications Commission, U.S. radio stations may broadcast programs for a general audience while simultaneously using a subchannel to deliver a subsidiary communications authority (SCA) program to a limited audience. To receive the subchannel a radio with a special decoder is needed; it costs about $55 and is less movable than regular receivers. Since SCA signals must be transmitted at lower power, the reception is possible for a much smaller area only. Because capital costs for station equipment range from $10,000 to $100,000, only about 50 non-commercial stations employ SCA (Carnegie Commission, 1979, p. 367).

SCA was first used in the U.S. in 1961 by the University of Wisconsin to transmit postgraduate medical programs over the state's FM radio network. Sca has enabled Ohio University (U.S.) to offer special programs to bus-riding high school students. Special reading services for the visually impaired learner exists in about 25 U.S. cities, with Oklahoma City having an impressive volunteer-staffed effort.

Video Media

Television: Broadcast and Cable. Of the almost 3,000 United States colleges and universities in the Higher Education Utilization Survey conducted by the Corporation for Public Broadcasting, 94 percent responded (Dirr & Pedone, 1980). Of the responding institutions, 71 percent reported using television for instructional and/or noninstructional purposes during 1978-79. Seven hundred-thirty-five (25%) colleges and universities reported offering 6884 courses over television to half a million students. While 44 percent of these courses were given on-campus, 14 percent were given off-campus. Of the two-year colleges about 50 percent of course use was off-campus. Almost one-quarter of the institutions using television for instruction worked with public television stations, while only 9 percent worked with cable television systems and 7 percent cooperated with commercial television broadcasters. Additionally, almost 30 percent of the colleges and universities using television for instruction were members of consortia offering or producing courses (Dirr & Pedone, 1980).

The United States Public Broadcasting System (PBS) has recently begun to utilize television-based courses produced by colleges and universities on its network service aimed at adult learners (PTV-3).

Corey describes Japan as the success story among nations using instructional television, with two networks broadcasting

40-45 courses each week to about 950,000 viewers (1980, p. 70). Also described are impressive adult literacy efforts by Danmarks Radio, the British Broadcasting Corporation, Germany's Follow Me program, and Swedish broadcasters. In conjunction with experimental use of television in India, France, and Senegal, UNESCO has established teleclubs for discussion of educational and community issues.

Some cost comparisons of television-based distance courses have been collected by Schramm (1977). In 1971 Japan spent $308 per year per student in its NHK television/radio/correspondance adult high school compared to $540 for conventional schools; the Bavarian Telekolleg averaged $143 per student per year in 1972 versus $540 in conventional schools (p. 133).

Chu and Schramm (1967) reviewed a total of 421 comparisons of instructional television with traditional instruction and found that students at all grade levels learn as well in almost every subject area. They also found that students are more favorable to television at younger ages.

The use of cable television for educational and community purposes was spurned in the U.S. by rulings of the Federal Communications Commission. In 1972 major market cable systems were required to maintain at least one channel each for public, educational, governmental and leased access. In addition, in 1976, any system with 3500 subscribers (regardless

of market size) was required to provide four public access channels if the demand for use was there and sufficient unused channels remained. As a result many community groups were formed to utilize such public access channels. Bender (1979) describes such groups in six U.S. cities.

About 25 percent of all television homes in the U.S. have cable television. There were about 4000 cable companies in the U.S. in 1980. Since systems in major markets are required to have at least 20 channels, there is a considerable opportunity yet available for educational programming. The use of fiber optics promises to provide more channels and a clearer picture.

One exciting development is talk-back cable television, which allows subscribers to push response buttons which get recorded on a computer at the cable system's control center. It allows viewers to take course tests at home or ask faculty members any questions they wish. This has begun to occur on the QUBE cable systems of Houston, Texas and Columbus, Ohio. Administrators of the largest distance education institution in Canada, the University of Waterloo, are making plans to use the new Canadian interactive television systems, Telidon and VISTA. It will be possible to provide students with rapid feedback solutions, as well as simulations with color and graphics (Knapper & Wills, 1980, p. 13).

Instructional Television Fixed Service. A low power, all-directional transmission system with a direct reception area of about 20 miles is ITFS, which stands for Instructional Television Fixed Service. The coverage area can be extended by signal repeaters and linked systems. It is narrow casting in the truest sense (Graff, 1980, p. 58).

Each ITFS licensee is allowed up to four channels which could be used independent of one another to serve different audiences simultaneously. The special receiving equipment costs about $2,000 per site.

There is a provision for two-way audio communication (using FM frequencies) which permits students and faculty to ask questions of one another. Three typical uses of ITFS by higher education institutions include: 1) closed circuit network for an institution with multiple locations; 2) feed to cable company, then to homes; and 3) link college or university to businesses, industry or medical institutions (Curtis, 1980). Baldwin (1975) provides a very comprehensive description of how ITFS systems have been used by urban universities to provide continuing education courses in engineering. More distant distribution has been done by point-to-point microwave transmission or videotapes brought to industrial and government locations by a commercial delivery service.

Videocassettes and Videodiscs. Since television does not stop to answer questions or adjust to individual differences,

substantial use of Videocassettes has emerged. Because videocassettes are relatively inexpensive, easy to use, and generally compatible with many different players, they have been put into use by many companies such as Xerox, Burrows, Coca-Cola, IBM, and Ford Motor Company for employee training and marketing (Norwood, 1976). The use of videocassettes by professional associations is also extensive and growing. For example, there are 60,000 attorneys in California (U.S.) using ones on new legal developments which have been prepared by a self-supporting unit of the state bar association.

In 1978, the Corporation for Public Broadcasting (U.S.) assigned the Nebraska Educational Telecommunications Network to investigate uses of videodisc technology in instructional and public television programs. Each videodisc looks like a photograph record. A 30-minute side contains 54,000 frames of pictures. The videodisc player is attached to the antenna terminals of a television set and the set's tuner is dialed to an unused channel. A low-power laser beam scans the micro-tracks of the disc and changes the signals into a television picture.

Graff (1980) observed that it is far cheaper to produce videodiscs in mass quantities than videotape. Much less storage space is required for the discs. Further, the variable speed control and frame by frame access capabilities permit greater options for presentation of materials. However, in contrast to videotape recorders, the videodisc equipment cannot collect programs off the home television set.

Satellites. There are three functionally different kinds of satellite television systems. First, a point-to-point system has a relatively low-powered transmitter which broadcasts over a vast area. Since its signals are very weak when they reach the ground, it takes an antenna about 85 feet across and expensive ($3million) amplification equipment. The second system, a distributing one, uses more transmitting power and concentrates on a limited geographic area. This permits the antenna size to be cut in half and the receiving equipment to be much less costly ($400,000). The third system, a broadcast one, uses very large transmitting power to permit the use of an antenna only 10 feet across.

Polcyn provided a comprehensive history of the development of communications satellites for educational training in the U.S. (1979). A case study of one particular effort is useful. The Appalachian Education Satellite Program was created in 1973 by the joint efforts of a regional planning commision and local public educators in eight states. In the first few years about 1200 teachers received graduate credit from 13 institutions. Since the satellite system was shown to have costs of delivery comparable to campus-based courses, with equivalent cognitive and affective outcomes, the network was expanded to include sites in 23 states, with academic credit now available at 52 colleges (Gross, 1979 , p. 65,66). Cable systems are also subscribers.

Computers

The two major classifications of computer applications for distance learning are computer assisted instruction and computer managed instruction (CAI and CMI). In situations falling under the first classification, the student is interacting with a computer directly. In CMI situations the student does not have direct interplay with the computer.

One of the more noteworthy systems of CAI is PLATO, which had its early development at the University of Illinois (U.S.). Its greatest assets include (1) remarkable graphing capabilities; (2) access to the calculating speed and power of a large computer; (3) student terminals which are heat sensitive to the location of a finger touching it and which trigger random access audio and video; and (4) terminals which can operate anywhere there is a telephone. The last characteristic is true of only certain CAI systems. In practice, the costs of long-distance telephone connections can be quite high. The highly versatile PLATO terminal is also quite expensive. What is beginning to happen in the United States is the establishment of regional networks of hardware and software to diminish the cost of connecting with such resources.

Many writers claim that CAI can help tailor instruction to individual student needs (Cross, 1976; Kelly & Anandam, 1979). Toward this end, Cooley and Glaser (1969) saw these functions for CMI: (1) present alternative goals which

students select to determine their learning paths; (2) conduct continuous monitoring and assessment to gather information such as how much practice a student requires, how well information is retained, what methods of study are selected and work well; (3) utilize previous performance data to prescribe specific methods of study or scope of testing; and (4) provide the instructor with group and individual statistics to help in the revision of course materials.

Particularly within distance education programs the communications between faculty and students have much impact upon motivating students to be capable, independent learners. Feedback to students about their performances has the greatest impact if it is prompt, clear, and carefully written to be motivating. The introduction in 1970 of a CMI system known as CADE at the Hermods Correspondance School in Sweden to provide feedback of that kind was prompted by a couple of important observations. First, although students rated the assignments to be submitted as the most stimulating part of a correspondance course, they viewed the tutor's corrections and comments as the least stimulating part of the course. Second, a majority of students preferred receiving a simple answer key rather than instructors' corrections and comments (Bååth & Månsson, 1977). Students displayed a very favorable attitude toward the new CMI system because it is

believed they preferred (1) legible, computer-printed comments (in contrast to handwritten ones); (2) the detailed comments which were given (300 words by the computer versus 20-50 by the live faculty member; and (3) the fact that the computer never gets tired or angry as faculty members sometimes do (p. 38).

Ehin (1973) provides an overview of computer support systems for distance education programs including places such as Quadriga-Funkkolleg (West Germany), Teleac (Holland), and Open University (England). A staff member of the Open University (Hooper, 1974) emphacized that without the computer, the mass teaching system would be virtually impossible (p. 181). Other systems include CAMOL at the University of Ulster (Northern Ireland); TIPS, headquartered at Duke University in the United States but used at about 1000 institutions worldwide; and RSVP of Miami-Dade Community College (U.S.) and about ten other institutions in North America.

In a meta-analysis of 54 studies comparing computer-based instruction (CBI) with conventional classes on examinations at the college level, Kulik, Kulik & Cohen (1980) found 14 statistically significant differences, 13 of which favored the computerized application. In all eight of the studies which collected data on the amount of time spent in instruction, the computer produced a substantial savings of time (about 25%). In summary, it is on the basis of time-saving and allowing individualization that the computer will be used.

Organization and Administration

Organizational Structure

Distance education courses are available from institutions that were created to provide only that type of delivery of instruction or as another service of an existing campus-based college or university. Within existing institutions distance courses could be offered through either continuing education or special organizational units. Staff of extended degree programs which were designed to be self-supporting found that administering the program through the campus continuing education division was both efficient and effective (Medsker et al., 1975:p.163). In addition, staff in several case study institutions warned that creating a new academic unit reduces both the interest and pressure on existing academic programs to be responsive to new clientele, curricular innovations, and delivery strategies(p.164). Thus the goal of maximizing program flexibility to experiment is balanced against the need for engendering faculty participation and overall credibility(p.162).

Cooperation with Other Institutions

Cooperative arrangements have emerged among educational institutions to share instructional resources and smooth the transfer of students from one college to another. For example, students can be simultaneously enrolled in a two-year college, North Island, and a four-year university, Athabasca, in western Canada. Many legally recognized groups, consortia,

operate in the United States to share the costs of televised instruction. Beaty(1979) discusses various governance, administrative, financial, and instructional aspects of such consortia.

Finances

McCabe noted that there were three major categories of cost in television-centered courses: 1) development or acquisition of instructional materials, 2) development of a basic delivery system and organization, and 3) the delivery of the instructional services (1979, p. 30). These categories are valid for all distance education systems. The first two categories are fixed costs which must be spread out over many students.

There are substantial difficulties in making international cost/benefit comparisons of different distance education systems. To start with, what may be an expense under one system is not in another; this is true of the charge for radio or television broadcast time. Secondly, there are different costs for the same service in different countries, related to labor charges and materials acquisition. Thirdly, there can be large differences observed between actual expenditures and estimated costs. Furthermore, efforts on behalf of on-campus and distance learning students overlap frequently. In the same manner, benefits to non-enrolled individuals, some of whom may be enticed to enroll later, are seldom determined.

Bates noted that one way to minimize the difficulties of comparing costs is to compare different media within the same system while stating clearly what affects particular costs (1980). The size of expenditures for certain media can be dramatically contrasting when a distance education program is compared to a campus-based one. For example, the British Open University has spent 22 percent of its budget on production of radio and television programs, with an equal amount going to hire faculty and counselors (Perry, 1977). Most campus-based colleges would expend the entire amount or more on instructional faculty.

The source of funds for non-campus colleges are similar to those for campus colleges; very little accommodation has been made to the different operating conditions, predominately part-time student enrollment, and small, widely-separated learning centers (Lombardi, 1977, p. 33). While extended degree programs commonly have tuition and fees greater than those for campus courses, the student saves substantial money by not having to miss as much revenue from not working in order to drive to and from the campus and attend classes (Medsker et al., 1975). Another reason for lower costs is the use of part-time faculty or regular faculty on an overload basis.

Although Jamison and Klees (1973) found many cost effective, multi-media based open learning projects, Klees found it disturbing to see many such systems concentrate on higher

cost video technologies, often to the exclusion of lower cost audio and print technologies (1975). He noted that much simpler television productions could be done for one-twentieth the cost, that a costly/high quality production may not be easily revisable, and that there are opportunity costs of being able to develop fewer courses (p. 128).

Course Development Costs

Because of the physical separation of teacher behaviors from learner responses which occurs with distance education, the instruction must be more carefully planned and executed than in the classroom. Frequently this planning necessitates the use of an instructional design team of specialists. Accordingly, the materials development process takes more time and is more costly than that needed for the classroom. The added cost and time means that revisions occur less often.

Student Services

Support services are almost as important to extended degree programs as the curriculum and the delivery systems used (Medsker et al., 1975, p. 111). One crucial service is the evaluation of students' previous life learning for course credits. The publications of the Council for the Advancement of Experiential Learning (U.S.) describe various approaches.

Certain factors make recruitment and counseling very important: some students lack confidence in their abilities as a student; some adults are cautious about a degree program

that is "different"; and some adults are rusty in reading, writing, and study skills. Common sources of recruitment are existing students or staff, faculty or counselors at another institution, an employer or employment agency, a friend or family member, and pamphlets.

From an analysis of state and local surveys of adult learning needs, Cross observed that from 20 to 50 percent of nonstudents indicated that lack of time due to job or home responsibilities was the largest barrier to their attendance at college (1978, p. 14). When this fact is coupled with the importance also given by nonstudents to lack of child care and transportation as barriers to enrollment, recruitment counselors must alert the public to the solutions that distance education programs can offer to these problems.

Telephone and Computer-Assisted Counseling

An excellent overview of the literature which describes different ways (mail, audio cassettes, telephone, and face-to-face meetings) to provide counseling services to distance learners was prepared by Thornton and Mitchell (1978). Attention was given to practices in Australia, the United Kingdom and the United States. Variations in the use of the telephone which were examined included 1) students calling anytime, 2) written requests for faculty to return calls at specific times, 3) connecting groups of students with loudspeaker telephones, 4) conference calls from up to eight student homes at once, and 5) dial access to recorded information

tapes. Also discussed were three methods of giving face-to-face counseling: campus counseling centers, regional centers, and itinerant counselors.

Arbeiter et al (1978) describe the advantages and disadvantages of using paraprofessionals to provide telephone counseling to individuals trying to evaluate postsecondary learning opportunities. The most valuable types of counseling were rated to be self-exploration, goal-setting, and career decision-making. The similarity of the demographic characteristics of the counselors to the socioeconomic status of the students boosted their credibility.

Miami Dade Community College (U.S.) uses its computer managed instruction system (RSVP) to provide academic alert and encouragement letters to students who need improvement in performance and/or attendance. The computer makes it possible to track the importance of student characteristics such as faculty or self-advised, native English language or not, reading skills, and mathematics skills.

Registration

Two major aspects of course registration differ among distance education programs. Although many of the extended degree programs examined by Medsker et al. (1975) which had used continuous registration processes decided to abandon that approach, some institutions do so with substantial computer support. The other varying aspect is the use of a provisional registration to permit students to sample courses.

Faculty and Students

Harris completed a survey of 569 faculty (tutors) from seven representatively-sized correspondence institutions in England (1975). He discovered that 99 percent of the faculty worked part-time, with 55 percent handling only one course. Three-fourths of the tutors were men and one-tenth were retired from full-time work elsewhere. While only 15 percent of the tutors were under age 30, 28 percent did not have previous teaching experience (although they did have considerable professional experience). With regard to activities, one-quarter of the faculty had written comments to from 40-200 students in the previous two weeks during the same time that one-third of the faculty had written to less than five students.

The overwhelming majority of instructors in U.S. non-campus colleges teach on a part-time basis; they come from three principal sources: other educational institutions, recent university graduates, and non-teaching professionals (Lombardi, 1977, p. 48). When the distance education unit is affiliated with a campus college full-time faculty members from there are used in most cases to teach (deliver) distance courses. The employment of regular faculty provides increased capability to get approval from other faculty and to match instruction to college objectives.

Faculty Rewards

There are some disadvantages to using regular faculty.

They have overly heavy workloads when teaching the distance education course as an overload. This condition may diminish the completion of some responsibilies, while providing little time for professional development. Further, their participation in distance education efforts does not always get adequate attention in promotion decisions. The type of generalist skills required of many tutors may prevent them from keeping current in specialty fields, which would reduce their attractiveness to other institutions when seeking subsequent, more traditional positions.

Medsker et al. (1975) found a variety of regular load and overload compensation patterns in their twelve extended degree case study institutions. While regular load payments require negotiations with regular academic units about the proportion of time that will be devoted to distance education activities, it does not entangle faculty in excessive workloads. Faculty find overload payments attractive, although they are concerned about its detrimental aspects. The distance education unit pays faculty at a lower rate as overload than regular load.

Delivery Faculty Roles

Fundamentally, the faculty member who is responsible for providing to students (delivering) media-based courses serves as a mentor who assists students in their independent learning. Such assistance might include: 1) answering

questions which arise in students' minds as they use the standard instructional materials of the course, 2) directing students to appropriate additional resources, 3) giving emotional support to students who want to continue or leave a particular course, 4) orchestrating group and individual meetings with students when needed, and 5) evaluating student achievements in structured and unstructured ways.

Development Faculty Roles

Because mass media-based courses are structured with reduced or no class meetings, instructional materials for these courses must be designed to be as self-contained as possible. In addition to utilizing formats for the materials which compel the student to engage in active responses to the concepts presented, the writer of the materials must anticipate what are likely to be commonly asked questions. As much as the tempo of the instruction permits, the anwers to these common questions will be included. An excellent discussion of development faculty roles that is more detailed can be found in Field (1979).

Student Characteristics

Students in college-level distance education courses are considerable older than their campus counterparts, with a mean average of between 30 and 35 years of age. A majority of these students have taken some previous college courses. In general, the more prior education people have the more likely they are to seek additional learning opportunities, regardless of delivery system. Although many open learning

systems were designed to serve previously underrepresented socioeconomic levels of students, this has taken place slowly. To illustrate, the British Open University in its first year had only 10 percent of its students from blue collar homes, while just ten years later almost half the students are.

While Schramm (1977) observed that distance education courses for the working people of Europe attract a disproportionate percentage of men, the ratio is in favor of women in the United States.

Student Attrition

Much of the existing research indicates that students do not complete distance education courses as often as they do classroom-based ones. Several researchers have observed how correspondence retention rates of 25 percent have been increased to about 65 percent with the addition of a television component to the same course (Lipson, 1977; Chamberlin & Icenogle, 1975). Many students indicate that the television lessons serve as a pacing mechanism (Brown, 1975). The criticality of a steady rate of progress to a student's completion of a course has been demonstrated by DeGoede & Hoksbergen (1978).

A recent trend of retention research is to try to measure the extent to which students indicate they have met their own differing goals, rather than the singular goal of obtaining a degree. A longitudinal study of over thiry-two

thousand students at 32 California community colleges over six semesters ending in 1976 showed 60 percent of the students leaving before their goals were completed, but over one-third of them later reenrolling (Knoell, 1976).

Research and Evaluation

MacKenzie, Postgate and Scupham (1975) noted that research and evaluation have greater importance to open learning than they have had in conventional education because: 1) innovative proposals require more documentation; 2) distance learning systems involve such costs of advanced production and distribution that they are not easily modified and must be used for a considerable number of years; 3) authors do not come in close contact with students using the materials, making it hard to know when revisions are needed; and 4) visibility to the public as well as students within some delivery modes re-enforces the need for careful planning and analysis (p. 46).

One of the few centers which do extensive research on various aspects of distance education is the German Institute for Distance Studies at the University of Tubingen in the Federal Republic of Germany. Its research focuses upon the economics, planning, and impact of various delivery systems. In addition, it evaluates individual courses, produces a radio college series, and sponsors self-study projects. It publishes in German two series of research papers and annual reports.

Determining Learner Needs

In analyzing more than 30 major state and national (U.S.) assessments of the needs and interests of adult learners in further education, Cross found extensive replications of methodology and findings similar to the seminal work of Johnstone and Rivera(1965) and Carp, Peters, and Roelfs (1974)(1978, p. 62).

Evaluation Criteria

Gooler (1979) has proposed a number of criteria for determining the success of an open learning program. The access criterion indicates how many and what kinds of people are served. A second criterion is the relevance of the program to the needs and expectations of the community. The quality of learner outcomes and program offerings, as well as their cost effectiveness, are additional criteria. Influences upon institutional goals, policies, and practices are known as institutional impact. There may be consequences for other kinds of institutions and society in general. An example of this last criterion would be the generation of new knowledge. A variety of evaluation efforts have employed criteria similar to these.

One noteworthy, comprehensive approach to determining the costs and benefits of nontraditional and traditional programs of colleges and unversities is PERC (Program Effectiveness and Related Costs)(Palola, Sunshine & Lehmann, 1977). It was originally developed at Empire State College in New York, but it has been used by a variety of institutions

in the past few years.

Comparisons with Campus Institutions

McIntyre and Wales (1976) compared the effectiveness and costs between the non-campus Whatcom Community College in Washington (U.S.) and three similarly-sized campus-based colleges. Among the findings were that Whatcom 1) seemed to perform as well in most operational areas, 2) performed no better in assessing and meeting the needs of target groups, and 3) spent 10 percent less per student and six percent less per course.

Kiesling did an estimated cost comparison of the University of Mid-America (UMA) in contrast to a sample of thirty-seven traditional colleges and universities in Indiana, projecting that UMA would be cost competitive with more enrollments. Unfortunately, almost all published cost comparisons are based on estimated costs. The fact that the distance institution studied by Kiesling never did obtain those greater enrollments is a significant commentary on the use of estimated costs.

Summary and Conclusions

This international review of distance education has shown the magnitude, diversity and impact of this phenomenon. Despite a recent trend toward multiple media use, the major way to provide distance education is still printed materials. Distance education is successful at all educational levels in many content areas in economically diverse countries.

It is only under conditions of high enrollment that the use of technology in courses, especially broadcast media, becomes more cost effective in comparison to classroom-based achievement by students. Furthermore, in many cases, broadcast radio or audiocassettes can be substituted for broadcast television, which is about five times more expensive.

Distance education will become even more important in the future than it is now because a higher value will be placed on saved student time away from work and on the cost of transportation fuels.

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